ABSTRACT OF THE DISCLOSURE

A method and system provide in-stream compression of bytes of digital image sensor data. A specified number of least significant bits of the byte of digital image sensor data is masked or dropped to reduce the amount of image data if a frame of image data. After masking, alternate bytes of digital image sensor data are subtracted to produce an entropy-reduced data model. The difference bytes of digital image sensor data are split into a predetermined number of channels, each channel having a bit width such that the sum of the bit widths of each channel equals a bit width of the byte of digital image sensor data. Each channel is operated upon by a distinct cumulative distribution function before being multiplexed. The multiplexed digital image sensor data is encoded by arithmetic compression encoding. The method and system also utilize a division-free method of arithmetic encoding to simplify the hardware requirements of encoding. Lastly, the method and system utilize a round-robin removal approach for adaptively fixing a number of elements in a histogram.